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CODE IDENT NO. 25500

25X1A

[redacted]

Progress Letter for Period

1 August - 1 September 1964

MODULATED-LIGHT FILM VIEWER SYSTEM

25X1A [redacted]

15 September 1964

218-52 (6-63)
REF: ENGINEERING PROCEDURE 3-017

DECLASS REVIEW by NIMA/DOD

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[redacted]

1. Progress of Work to End of Period

The objective of this program is to determine the feasibility of a Modulated-Light Film Viewer that will provide a variable backlight intensity according to the density and spatial frequency of the image being backlighted. Effort during this reporting period consisted of conceptual studies in the area of detection of the transmission amplitudes and frequencies along with the associated backlighting techniques.

The closed-loop modulated flying spot scanner breadboard was modified by replacing the half-silvered mirror with a high efficiency dichroic mirror and also replacing the P-4 phosphor CRT with a P-17 phosphor CRT. The evaluation of this breadboard is in progress. Operation of this breadboard has demonstrated a lag in the feedback loop. An investigation of an optical means of compensating for this delay has been initiated. If a two color phosphor is used, it is possible to utilize one color for detection, and the second for backlighting. Due to the unidirectional scan of the CRT, the light used for detection can be displaced relative to the backlight so that the detection spot image leads the backlight image by an amount equal to the lag in the closed loop. The approach being investigated utilizes the dispersive power of an optical wedge.

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A CRT with a combination P-4 and P-16 phosphor has been ordered. The P-16 phosphor exhibits a very short persistence and peaks at about 3700 Å while the P-4 phosphor has a much longer persistence and is relatively white. The P-16 phosphor can be used for detection and the P-4 phosphor can provide the backlight.

The work on integrating the optical spatial filter-TV sensor loop with the flying spot scanner loop has been postponed until the FSS loop has sufficient resolution to quantitatively determine the distortions that will exist between the two scans.

A material investigation is being conducted in an effort to obtain a screen material that specularly transmits light at one wavelength and scatters light at another wavelength. One material being investigated is a transparent plastic with a fluorescent material compounded in it. This material scatters green light yet transmits blue specularly. An effort is being made to process the phosphor granules into a thin layer of transparent material.

Preliminary configuration layouts of viewers which would meet the characteristics set forth by the human engineering requirements have been started. Tentative means of film handling, mechanical masking, and positioning controls are being investigated.

2. Problem Areas Encountered

The major problem area encountered is the requirement for high

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resolution for the detection and modulation of high spatial frequencies. A second problem is the requirement for a semi-specular screen capable of transmitting specularly the detection light and scattering the backlight. A third problem is the distortion between the detection and backlighting systems.

3. Projected Work for Next Period

The P-4/P-16 combination phosphor CRT will be obtained and installed in the breadboard. The resultant response of the closed loop will be measured. Transparent luminescent films will be attempted to solve the semispecular screen problem. Work will continue on the viewer layout and high intensity CRT investigation.

4. Status of Fund Expenditures as of August 31, 1964

Hours	607
Labor and Overhead	[redacted]
Material	
G and A	
Total	

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5. Confirmation of Verbal Agreements

No verbal agreements were made during this period.

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